AMENDMENT AND PRESENTATION OF CLAIMS

Please replace all prior claims in the present application with the following claims, in which claims 2, 17 and 43 are canceled without prejudice or disclaimer (claims 4, 8-15, 18-21, 26-29, 34-41 and 44-47 having been previously canceled), claims 1, 3, 5-7, 16, 30, 31, 33 and 42 are amended, and claims 52-58 are newly presented.

1. (Currently Amended) A method of providing ~~a~~ synchronization ~~signal to a terminal which is adapted for use~~ in a communications network, the method comprising:

transmitting to ~~said~~ a first terminal a ~~communication~~ carrier signal comprising a plurality of frames, each of said frames comprising ~~at least one~~ a plurality of time slots~~, and arranging respective groups of said frames into a respective superframe; and~~ ,

~~including~~ wherein ~~a respective portion of said synchronization signal in at least one said time slot of a plurality of said frames, said synchronization signal including~~ one of the time slots includes beacon information and another one of the time slots include data output by a second terminal ~~which is adapted for use by said terminal to control transmission timing of said terminal; and~~

~~for each said superframe, said including step includes a portion of said synchronization signal in each said frame, such that each said portion comprises a respective phase signal that is unique for each respective frame within a particular superframe~~ .

2. (Canceled) ~~The method of claim 1 wherein said including step includes in each of said frames said respective portion of said synchronization signal in at least one time slot.~~

3. (Currently Amended) The method of claim 1, wherein ~~said including step includes said portion of said synchronization signal in each said frame, such that said synchronization signal~~ the one time slot comprises a unique word signal that is substantially the same in each frame.

4. (Canceled).

5. (Currently Amended) The method of claim 1, wherein ~~said transmitting step further includes transmitting the start of each of~~ said frames form one or more superframes such that ~~it~~ the start of the superframe substantially coincides with the start of one of said frames.

6. (Currently Amended) The method of claim 5 wherein ~~said transmitting step further includes transmitting~~ the start of each of said frames is transmitted such that ~~it~~ the start of each of said frames substantially coincides with the start of one of said time slots.

7. (Currently Amended) The method of claim 4 5, wherein ~~said including step includes said phase signals~~ the beacon information in said frames of said superframes is in the same order for each said superframe.

8-15. (Canceled).

16. (Currently Amended) A method of providing ~~a~~ synchronization ~~signal to a terminal adapted for use~~ in a satellite communication system, the method comprising:

generating ~~said synchronization signal~~ beacon information as a plurality of unique phase signals; and

transmitting a ~~communication~~ data signal to ~~said~~ a terminal, said ~~communication~~ data signal comprising a plurality of frames, a portion of each frame comprising a respective one of said plurality of unique phase signals~~; and~~ ,

~~wherein said communication signal comprises a plurality of superframes, each superframe comprising a plurality of said frames, such that the order of unique phase signals in each frame repeats in every superframe; and~~

wherein the ~~number of frames per superframe is equal to the number of unique phase signals~~ data signal further includes data from another terminal.

17. (Canceled) ~~A method of providing a synchronization signal to a terminal adapted for use in a satellite communication system, the method comprising:~~

~~generating said synchronization signal as a plurality of unique phase signals; and~~

~~transmitting a communication signal to said terminal, said communication signal comprising a plurality of frames, a portion of each frame comprising a respective one of said plurality of unique phase signals; and~~

~~wherein said communication signal comprises a plurality of superframes, each superframe comprising a plurality of said frames, such that the order of unique phase signals in each frame repeats in every superframe; and~~

~~wherein said transmitting step transmits said communication signal such that the beginning of each superframe substantially coincides with the beginning of one of said frames.~~

18-21. (Canceled).

22. (Previously Presented) A method of acquiring a communication signal, the communication signal comprising a plurality of frames, each frame comprising a plurality of time slots, at least one time slot in each frame having synchronization data with a unique word signal contained therein, the method comprising:

(a) setting the gain of an automatic gain control circuit based on the maximum power measured in continuous time intervals being less than the duration of one time slot of each frame;

(b) correlating at least one frame with a locally generated unique word signal at at least one of a plurality of possible frequencies;

(c) storing a correlation value for each of said possible frequencies;

(d) setting a numerically controlled oscillator (NCO) frequency based on a desired correlation value of said possible frequencies;

(e) repeating steps (a)-(d) while the correlation value is below a frequency acquisition threshold, and when said correlation value is at least equal to said frequency acquisition threshold, performing the steps of:

(f) determining an arrival time of the unique word signal in a first frame;

(g) estimating an estimated arrival time of the unique word signal in a second frame based on the arrival time of the unique word signal in said first frame;

(h) determining the actual arrival time of the unique word signal in said second frame;

(i) calculating a difference between the estimated arrival time and the actual arrival time;

(j) adjusting a voltage controlled oscillator (VCO) frequency based on said difference;

(k) repeating steps (f)-(j) while said difference is not below a timing acquisition threshold to determine acquisition of said communication signal.

23. (Original) The method of claim 22, wherein said step of setting the gain measures time intervals that are no more than half of the duration of one time slot.

24. (Original) The method of claim 22 wherein said correlating step is performed at each of said plurality of possible frequencies.

25. (Original) The method of claim 22 wherein said step of setting the NCO frequency sets the NCO frequency based on the maximum correlation value of said possible frequencies.

26-29. (Canceled).

30. (Currently Amended) A system for providing ~~a~~ synchronization ~~signal to a terminal which is adapted for use~~ in a communications network, the system comprising:

a transmitter for transmitting to ~~said~~ a first terminal a signal including a plurality of frames, each of said frames including ~~at least one~~ a plurality of time slots~~;~~ ,

wherein said transmitter includes ~~a respective portion of said synchronization signal in at least one said time slot of a plurality of said frames, said synchronization signal including~~ beacon information in one of the time slots and data ~~which is adapted for use by said terminal to control the transmission timing of said terminal~~ output by a second terminal in another one of the time slots~~; and~~

~~wherein the signal includes a plurality of superframes, each of said superframes including a plurality of said frames, and wherein said portion of said synchronization signal includes a phase signal that is unique for each frame within a particular superframe~~.

31. (Currently Amended) The system of claim 30, wherein said frames form one or more superframes, and the start of each of said superframes substantially coincides with the start of one of said frames.

32. (Original) The system of claim 31, wherein the start of each of said frames substantially coincides with the start of one of said time slots.

33. (Currently Amended) The system of claim 30, wherein ~~said transmitter includes said~~ the beacon information is represented by a plurality of phase signals ~~in said frames such that~~, and the order of the phase signals is the same in each respective superframe.

34-41. (Canceled).

42. (Currently Amended) A system for providing ~~a~~ synchronization ~~signal to a terminal adapted for use in a satellite communication system~~, the system comprising:

a transmitter adapted to generate ~~said synchronization signal~~ beacon information as a plurality of unique phase signals and to transmit ~~said synchronization~~ a data signal to ~~said~~ a terminal, said ~~synchronization~~ data signal comprising a plurality of frames, a portion of each frame comprising a unique one of said plurality of unique phase signals; and

~~wherein the synchronization signal comprises a plurality of superframes, each superframe comprising a plurality of said frames, such that the order of unique phase signals in each frame repeats in each superframe; and~~

wherein the ~~number of frames per superframe is equal to the number of unique phase signals~~ data signal further includes data from another terminal.

43. (Canceled) ~~A system for providing a synchronization signal to a terminal adapted for use in a satellite communication system, the system comprising:~~

~~a transmitter adapted to generate said synchronization signal as a plurality of unique phase signals and to transmit said synchronization signal to said terminal, said synchronization signal comprising a plurality of frames, a portion of each frame comprising a unique one of said plurality of unique phase signals; and~~

~~wherein the synchronization signal comprises a plurality of superframes, each superframe comprising a plurality of said frames, such that the order of unique phase signals in each frame repeats in each superframe; and~~

~~wherein the beginning of each superframe coincides with the beginning of one of the frames.~~

44-47. (Canceled).

48. (Previously Presented) A system for acquiring a communication signal, the communication signal comprising a plurality of frames, each frame comprising a plurality of time slots, at least one time slot in each frame having synchronization data with a unique word signal contained therein, the system comprising:

a correlator adapted to correlate at least one frame of said communication signal with a locally generated unique word signal at at least one of a plurality of possible frequencies, to store a correlation value for each of said possible frequencies, and to set a numerically controlled oscillator (NCO) frequency based on a desired correlation value of said possible frequencies;

a gain setting device adapted to set the gain of an automatic gain control circuit (AGC) based on the maximum power measured in each frame in predetermined time intervals each being less than the duration of one time slot, to apply said gain to said communication signal, and to continue setting the gain of the AGC until said correlator generates a correlation value above a frequency acquisition threshold;

a voltage controlled oscillator (VCO) frequency offset reducer adapted to:

determine an arrival time of the unique word signal in a first frame;

estimate an estimated arrival time of the unique word signal in a second frame based on the arrival time of the unique word signal in said first frame;

determine the actual arrival time of the unique word signal in said second frame;

calculate a difference between the estimated arrival time and the actual arrival time;

adjust a VCO frequency based on said difference, and

repeat functions (a)-(e) on subsequent frames if said difference is not below a timing acquisition threshold value; and

a mode selection circuit for causing the system to enter a tracking mode if said difference is below said timing acquisition threshold value.

49. (Original) The system of claim 48, wherein said predetermined time interval is no more than half of the duration of one time slot.

50. (Original) The system of claim 48, wherein said correlator correlates at least one frame with a locally generated unique word signal at each of said plurality of possible frequencies.

51. (Original) The system of claim 48, wherein the correlator sets the NCO frequency based on the maximum correlation value of said possible frequencies.

52. (New) A method of communicating in a wireless network, the method comprising:

generating a downlink signal including a beacon signal and data, wherein portions of the beacon signal are provided in a plurality of frames of the downlink signal; and

transmitting the downlink signal over a single carrier to a terminal, wherein the terminal utilizes the beacon signal to derive frequency and timing information for generating an uplink signal.

53. (New) The method of claim 52, wherein each of the frames includes a beacon slot including one of the portions of the beacon signal, the one portion including a unique word sequence and frame position information.

54. (New) An apparatus for communicating in a wireless network, the apparatus comprising:

means for generating a downlink signal including a beacon signal and data, wherein portions of the beacon signal are provided in a plurality of frames of the downlink signal; and

means for transmitting the downlink signal over a single carrier to a terminal, wherein the terminal utilizes the beacon signal to derive frequency and timing information for generating an uplink signal.

55. (New) The apparatus of claim 54, wherein each of the frames includes a beacon slot including one of the portions of the beacon signal, the one portion including a unique word sequence and frame position information.

56. (New) A method of providing synchronization based on a communication signal including a plurality of frames, each frame including one or more time slots, the method comprising:

setting the gain of an automatic gain control circuit based on the maximum power measured in continuous time intervals being less than the duration of a time slot of each frame of the communication signal;

correlating at least one frame with a locally generated unique word signal at at least one of a plurality of frequencies;

storing a correlation value for each of the frequencies;

setting an oscillator frequency based on a correlation value of the frequencies;

determining whether the correlation value is below a frequency acquisition threshold;

determining an arrival time of a unique word signal in a first frame;

determining an estimated arrival time of the unique word signal in a second frame based on the arrival time of the unique word signal in the first frame;

determining a difference between the estimated arrival time and an actual arrival time;

adjusting a voltage controlled oscillator (VCO) frequency based on the difference;

comparing the difference with a timing acquisition threshold; and

determining acquisition of the communication signal based on the comparison.

57. (New) An apparatus for providing synchronization based on a communication signal including a plurality of frames, each frame including one or more time slots, the apparatus comprising:

means for setting the gain of an automatic gain control circuit based on the maximum power measured in continuous time intervals being less than the duration of a time slot of each frame of the communication signal;

means for correlating at least one frame with a locally generated unique word signal at at least one of a plurality of frequencies;

means for storing a correlation value for each of the frequencies;

means for setting an oscillator frequency based on a correlation value of the frequencies;

means for determining whether the correlation value is below a frequency acquisition threshold;

means for determining an arrival time of a unique word signal in a first frame;

means for determining an estimated arrival time of the unique word signal in a second frame based on the arrival time of the unique word signal in the first frame;

means for determining a difference between the estimated arrival time and an actual arrival time;

means for adjusting a voltage controlled oscillator (VCO) frequency based on the difference;

means for comparing the difference with a timing acquisition threshold; and

means for determining acquisition of the communication signal based on the comparison.

58. (New) A system for acquiring a communication signal, the system comprising:

a correlator adapted to correlate one frame of the communication signal with a locally generated unique word signal at at least one of a plurality of possible frequencies, to store a correlation value for each of the frequencies, and to set an oscillator frequency based on a desired correlation value of the frequencies;

an automatic gain control circuit (AGC) configured to be set based on the maximum power measured in each frame in predetermined time intervals each being less than the duration of one time slot, wherein the gain is applied to the communication signal, and the gain of the AGC is repeatedly set until the correlator generates a correlation value above a frequency acquisition threshold;

a voltage controlled oscillator (VCO) frequency offset reducer adapted to adjust a VCO frequency based on a difference of an estimated arrival time of a unique word signal in a subsequent frame based on the arrival time of a unique word signal in a prior frame and an actual arrival time of the unique word

signal in the subsequent frame, wherein the difference is repeatedly determined if the difference is not below a timing acquisition threshold value; and

a mode selection circuit for causing the system to enter a tracking mode if the difference is below the timing acquisition threshold value.